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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/561,205	02/03/2006	Masahiro Sakurada	126342	3908
25944	7590	05/01/2007		
OLIFF & BERRIDGE, PLC P.O. BOX 19928 ALEXANDRIA, VA 22320			EXAMINER HITESHEW, FELISA CARLA	
			ART UNIT 1722	PAPER NUMBER
			MAIL DATE 05/01/2007	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

## Office Action Summary

Application No.

10/561,205

Applicant(s)

MASAHIRO SAKURADA

Examiner

Felisa C. Hiteshew

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 10-57 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 10-17 and 42-57 is/are rejected.
- 7) ☒ Claim(s) 18-41 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/19/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_.

***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

The PTOL 1449 filed on 12/19/2005 has been received, reviewed and considered.

***Claim Rejections - 35 USC § 112***

2. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 10, line 15, the terminology "...desired defect region..." is being considered vague and indefinite.

Use of terms such as "desirable" and "appropriate" when referring to certain parameters do not limit present disclosure to specific percentages recited. --Payet and Brummet v. Swidler and Wilson (POBdPatInter) 207 USPQ 168.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein

were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 10-17 and 42-57 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,482,260 B2 (Sakurada, et al).

Sakurada, et al '260 B2 teaches a Czochralski method for producing a silicon single crystal, comprising a silicon single crystal pulled so that  $\Delta G$  is may be 0 or a negative value, where  $\Delta G$  is a difference between the temperature gradient  $G_c$  ( $^{\circ}\text{C}/\text{mm}$ ) at the center of a crystal and the temperature gradient  $G_e$  ( $^{\circ}\text{C}/\text{mm}$ ) at the circumferential portion of the crystal, namely  $\Delta G = (G_e - G_c)$ , wherein  $G$  is a temperature gradient in the vicinity of a solid-liquid interface of a crystal from the melting point of silicon to  $1400^{\circ}\text{C}$  (See col. 3, lines 66-68; col. 4, lines 1-9). Sakurada, et al '260 B2 also teaches a CZ pulling method wherein a defect-free wafer whose entire surface is occupied by an N-region, through control of the intra-furnace temperature such that the difference  $\Delta G$  between the temperature gradient  $G_c$  at the center of a crystal and the temperature gradient  $G_e$  at the circumferential portion of the crystal become  $5^{\circ}\text{C}/\text{cm}$  or less [ $\Delta G = (G_e - G_c) < 5^{\circ}\text{C}/\text{cm}$ ] and adjustment pulling rate. Figure 2 illustrates the OSF region distributed in a ring shape, and the entire cross section other than OSF region is occupied by N-region in the portion pulled with maintaining an optimal growing rate (See col. 7, lines 5-12; lines 42-49; and lines 63-68, respectively).

The difference being that Sakurada, et al '260 B2 does not exactly teach "wherein  $V/G_c$  is controlled so that the defect region of the single crystal to be grown is N region over a whole plane in a radial direction" or wherein the "...distance between the surface of the raw material melt and the heat insulating member is changed by adjusting an elevation rate of a crucible containing the raw material melt to move a level of the raw material melt up and down and/or by moving a position of the heat insulating member up and down". However, in the absence of unobvious results, it would have been obvious to one of ordinary skill in the art to optimize and modify the process parameter limitations, as taught by Sakurada, et al '260 B2, through routine experimentation in order to ensure proper orientation. The motivation is for having a silicon single crystal produced under a stable manufacturing condition wherein OSF in the ring shape distribution is generated when it is subjected to thermal oxidation of latent nuclei of OSF is present in a low density, and neither FPD, COP, L/D, LSTD is present.

***Allowable Subject Matter***

6. As allowable subject matter has been indicated, applicant's reply must either comply with all formal requirements or specifically traverse each requirement not complied with. See 37 CFR 1.111(b) and MPEP § 707.07(a).

7. Claims 18-41 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

A reference is good not only for what it teaches by direct anticipation but also for

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what one of ordinary skill might reasonably infer from the teachings. In re Opprecht 12 USPQ 2d 1235, 1236 (CAFC 1989); In re Bode 193 USPQ 12; In re Lamberti 192 USPQ 278; In re Bozek 163 USPQ 545, 549 (CCPA 1969); In re Van Mater 144 USPQ 421; In re Jacoby 135 USPQ 317; In re LeGrice 133 USPQ 365; In re Preda 159 USPQ 342 (CCPA 1968).

Expected beneficial results are evidence of obviousness, just as unexpected beneficial results are evidence of unobviousness. In re Novak 16 USPQ 2d 2041 (Fed. Cir., BPAI 1989); In re Hoffman 194 USPQ 126 (CCPA 1977); In re Skoll 187 USPQ 481 (CCPA 1975); In re Skoner 186 USPQ 80 (CCPA 1975); In re Garshon 152 USPQ 602 (CCPA 1967).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Felisa Hiteshew whose telephone number is (571) 272-1463. The examiner can normally be reached on Mondays through Thursday from 5:30 AM to 4:00 PM with Fridays off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Yogendra Gupta, can be reached on (571) 272-1316. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-1463.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through

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<http://pair-direct.uspto.gov>. Should you have questions on access to the Private

PAIR system, contact the Electronic Business Center (EBC) at 866- 217-9197

(toll-free).

  
FELISA NITESHEW  
PRIMARY EXAMINER